TrackSAT UltraTrack TS61

Installation and Operation User Manual

Ku-BAND TVRO ANTENNA with Australian 10700 LNB

Revision Ver. - 1.20

Congratulations on becoming a TrackSAT Satellite System Owner!

This TrackSAT TS-series TVRO satellite antenna system has been designed and manufactured to provide you the most in performance, cost efficiency and convenience. It is our goal that you will always be connected either for business or pleasure and enjoy a valuable experience.
This TrackSAT user manual has been developed as a guide to get the most delight and benefits from your Ku-band TVRO satellite antenna system. This operation manual includes information about TrackSAT UltraTrack TS-series equipment, installation, operating procedures, performance, and suggestions for its servicing and care.

TrackSAT recommends you to read this operation manual from cover to cover, and refer to it frequently.
Our Australia dealer organization and customer service department stands ready to serve you. The following service are offered by TrackSAT dealers:

- ✓ The warranty – provides coverage for parts and labor is available at TrackSAT dealers Australia wide.
- ✓ Our friendly servicing team provides you with respectful expert service.
- ✓ Factory approved service equipment to provide you systematic and accurate workmanship.
- ✓ A stock of authentic TrackSAT service parts on hands when you need them.

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1. Introduction

The TS-series antenna brings high quality satellite television to your vessel. The TVRO TS-series antennas are compatible with DVB-S2 and the MSAS (Multiple Satellite Auto Switching) function including 22 KHz Tone, DiSEqC, and DirecTV settings allows automatic switching between Foxtel & VAST set top boxes and also are compatible with Foxtel IQ boxes. The TS-series is a competitively priced antenna that is based on the same technology as the TrackSAT UltraTrack UT-series (TVRO), providing exceptional tracking ability, and is ideal for private and smaller vessels.

TS-Series Features

- **Attitude Heading Reference system(AHRS) using an IMU sensor**
  (3 axis gyro scope, 2 axis acceleration)
- **High performance stabilization in rough weathers**
- **Honest 3 axis system - Stabilized azimuth and elevation with a skew unit**
  Stabilized skew system guarantees perfect searching and tracking
- **Automatic skew control**
- **Antenna control unit displays heading value without gyro connection using AHRS derived from inverse kinematics technology**
- **Ready for gyro compass connection for faster and more stable satellite**
- **Tracking 6 sec of unwrap time**
- **Compatible for DVB-S2**
- **Provides over 80 satellites parameters**
- **DiSEqC 1.2, 22K tone & Direct TV function available**
- **(automatic satellite switching using receiver up to 4 satellites)**
- **DSP(Digital Signal Processor) control technology**
- **High gain reflector**
- **Built in GPS**

2. Installation

2.1 Product Components

① ADU (Above Deck Unit)

- the stabilized platform: contains the majority of hardware
- PCU (Pedestal Control Unit): controls electronics, movement system, and RF equipment
- RF Unit: receives optimum satellite signal from the satellite
- Radome: ultra-efficient plastic radome provides minimal loss and protect from marine environment

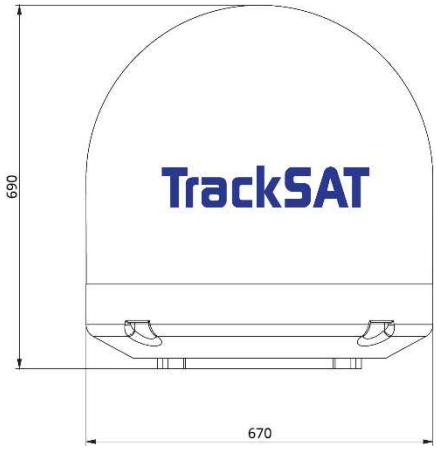


Figure 1 - Radome

② BDU (Below Deck Unit)

- The BDU controls the stabilized antenna and consists of the UltraTrack TS-series interface (ACU)

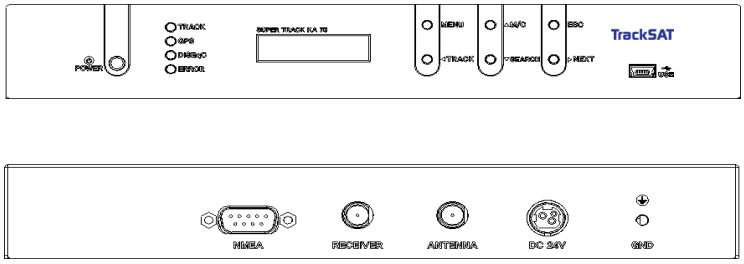


Figure 2 - KA78 ACU

2.1.1 Installation Kit List

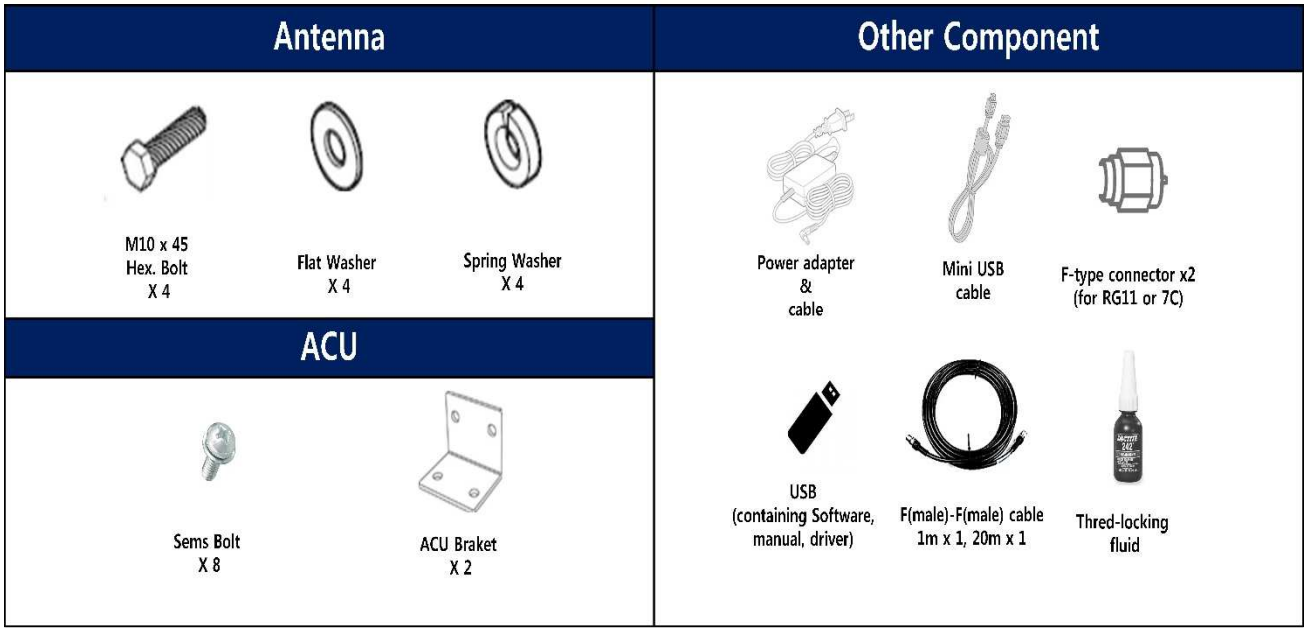


Figure 3 – Customer Kit List

2.1.2 Required Tools

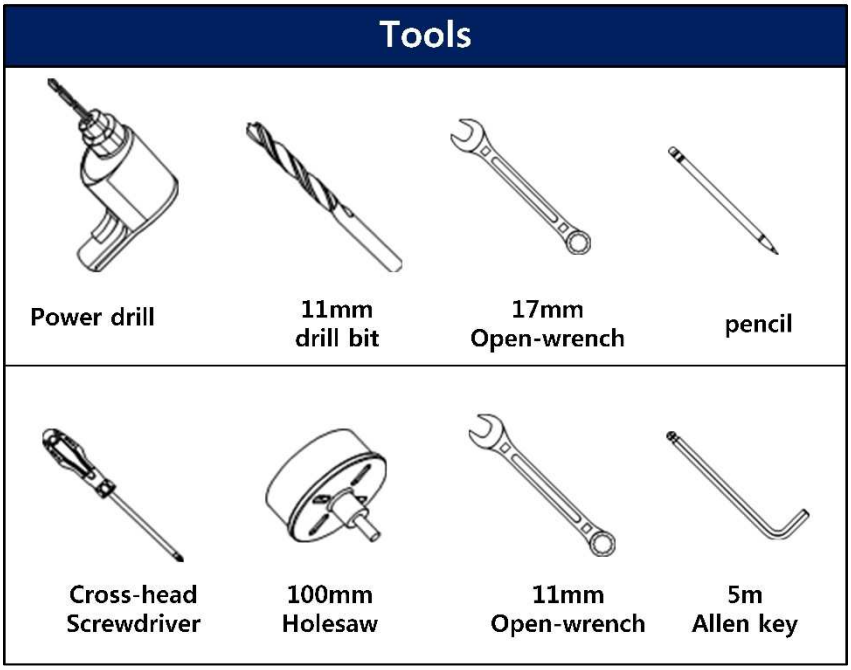


Figure 4 – Required Tools

2.2 Safety Precaution

- ✓ ADU module is sealed unit. This unit should be closed under any circumstances.
- ✓ The antenna radome assembly should be rigidly mounted on the boat. If necessary, reinforce the mounting area to assure that it does not flex due to the boat's motion or vibration.
- ✓ Environmental: must operate in controlled environment (temp, altitude, dust, vibration, corrosive, explosive free)
- ✓ EMC (elective magnetic compatibility): to ensure the antenna system provides the highest protection against interfering. The antenna should be in front of a radar beam.
- ✓ Cable must be shielded and all equipment must be covered
- ✓ During the lifting, the system has to be balanced. Swaying or dropping the radome assembly may cause personnel injury or damage to the system.

2.3. Unpacking

① Place the shipping box on a rigid, leveled surface.
② Inspect shipping box and note any damage.
③ Lift the unit out of the crate carefully
④ Move the antenna to its operating location (Using great care)
⑤ When you have the antenna in its permanent location, remove the securing materials (zip-tie, shipping foams and fixed bolt) which keeps the antenna from free moving while in transit.

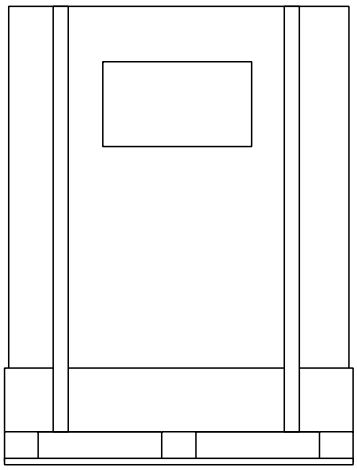


Figure 5 - Shipping box

Figure 6 - Shipping constrains

⚠ ***Warning:***

- *Do not turn the box upside down and roll, it may cause the damage to the antenna.*
- *Always lift the antenna unit by the baseplate to avoid damage.*
- *Do not supply the power before removing the securing materials. It may cause the damage to the system.*
- *When the antenna needs to be relocated, the securing material must be re-installed to prevent damage from free moving while in transit.*

2.4 Selecting Installation Site

The following should be kept in mind when selecting a physical location on the vessel for the antenna equipment:

2.4.1 ADU (Above deck Unit: antenna Unit)

① Visibility: the **TS61** needs clear line of sight to the satellite for the most vessel heading. Choose a location where masts or other structures do not block the satellite signal from the dish as the boat turns.

② Vibration: high vibration will effect in reducing its performance. Choose a location a far

from vibrating equipment as possible.

③ Cable runs: locating the ADU close to the radio room creates much easier installation.

④ Interference: the antenna should be installed in the beam of other transmitting antenna which may generate signals with the potential to interfere. The further away the UltraTrack TS series antenna is from these other antennas, the less likely is it to be affected by their operation.

⑤ Heat source: the antenna assembly unit has to be well away from engine (exhaust gas/ flare).

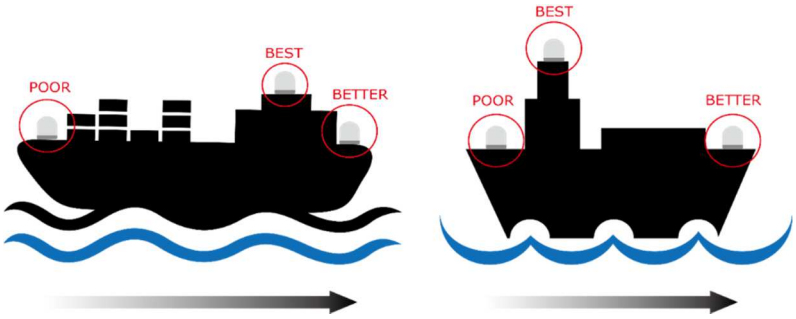


Figure 7 – Site Selection Example

2.4.2 BDU (Below deck Unit: ACU)

The ACU (Antenna Controller Unit) will arrive with the TrackSAT control software pre-installed and will automatically run on the power up and also operation is largely automatic but it is desirable that it be monitored periodically. Therefore, it is beneficial that it be sited in a location with easy operator access.

ACU should be installed in a radio room where:

- In a cool and dry location
- In a place that not susceptible to magnetic interference LCD display is visible and the buttons are easily accessible

2.5 Mounting and Installing the Antenna

Once antenna mounting site (on the power tower or separate antenna post) is identified, make mounting holes and cable access hole on the mounting surface. (see Figure – 8 and Appendix F - Mounting Hole Layout) and follow these steps for proper installation.

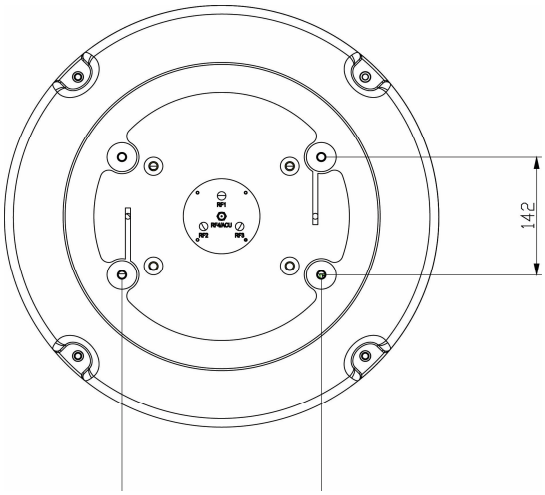


Figure 8 – Mounting pattern

2.5.1 Preparing Mounting Surface

① Clean the surface where the antenna to be mounted

② Mark the 4 bolting holes position and center point for cables hole on the mounting surface. (see Figure – 9)

③ Make 4 bolt holes on the surface by using the power drill with 11mm drill bit.

④ Make cable hole at the center position by using the power drill with 100mm hole-saw.

⑤ Remove sheet metal particle and clean the surface.

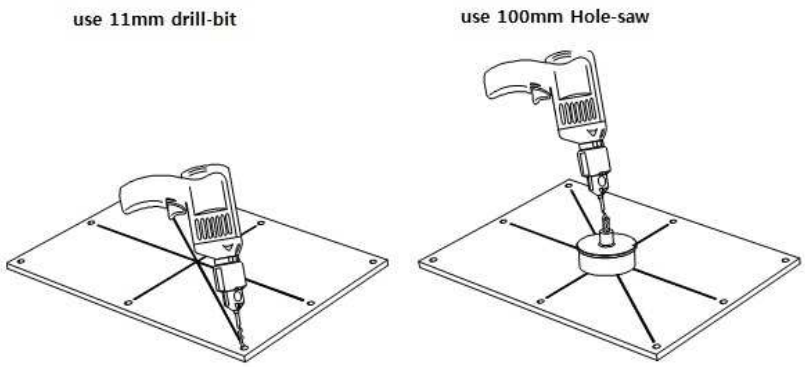


Figure 9 – Preparing the Mounting Surface

2.5.2 Installing the Antenna

① Lift the system onto its supporting post and position the antenna base plate in place in position over the mounting holes and cable access.

② Ensure the radome is pointing correct direction - align the **BOW label** on the bottom plate with the ship's bow and is parallel to the vessel's center line. (see Figure – 10)

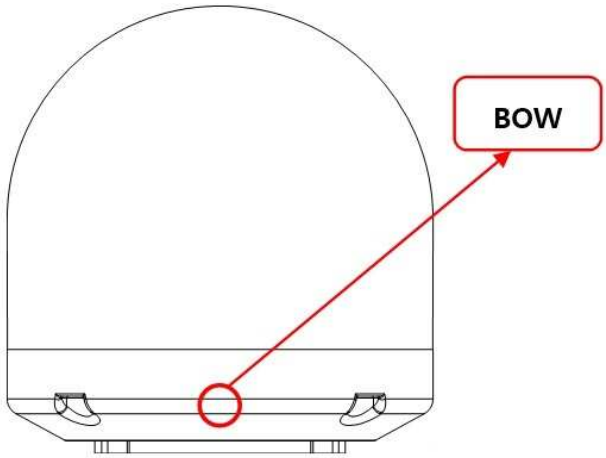


Figure 10 – Radome Bow Mark

③ Insert the flat and spring washer and a mounting bolt to each mounting holes around the base plate of the radome. (see Figure -11)

④ Apply Loctite to the threads of the mounting bolt up near the mounting surface and tighten each 4 bolts to 20 lb-ft (27 N-m) torque [use an 17mm socket or open-end wrench]. (see Figure – 11)

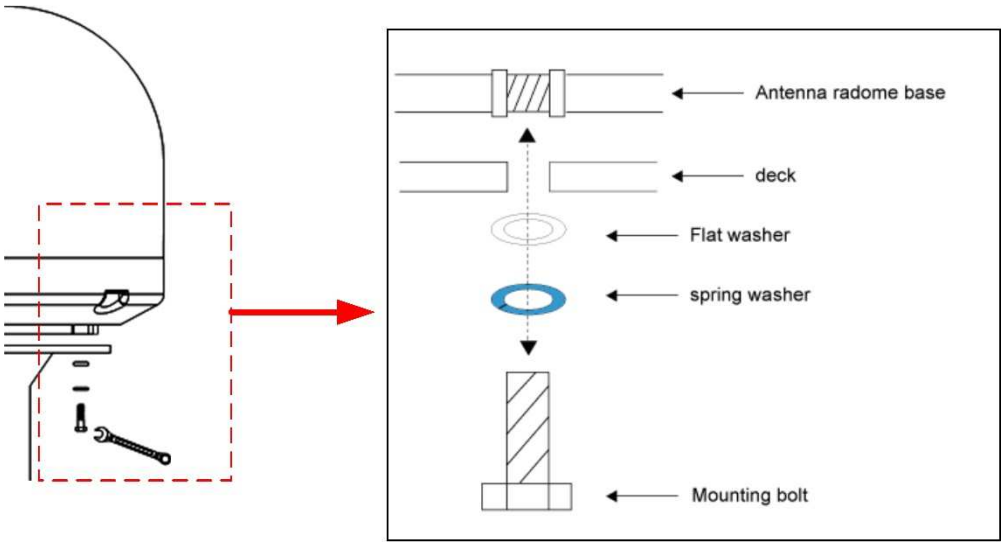


Figure 11 – Securing the Antenna

⚠ ***Do not over-tighten.*** *If the mounting bolt provided is too short, you will have to install mounting bolts of the appropriate length. If the bolt provided is too long, the excessive length should be cut off.*

2.6 ADU Cable Connection

Before starting the electric connection task, find the suitable location for laying the cables from BDU to ADU. The antenna cable must be connected to the ACU (Antenna Control Unit) and the antenna unit. Follow the steps below.

① Determine the type of cable to be used depends on the cable length required. (see Table – 1)

Cable Length	Cable Type
Within 20m	RG6
Within 50m	RG11
Within 100	LMR 400
Within 200m	LMR 600

Table 1 – RF Cable Guideline

② Bring the RF cables (with F-male type connector) from BDU (Below Deck Unit) up through the cable access hole.

③ Lay the cables through the waterproof fittings and close with sealing material to avoid water penetrating.

④ use 11mm open-end wrench to connect the RF cables to the RF4/ACU cable ports on the bottom of the radome (see Figure – 12)

⑤ Inspect carefully all the cable connectors (F-type) are fully screwed in and all cabling from BDU is fully shielded and sealed.

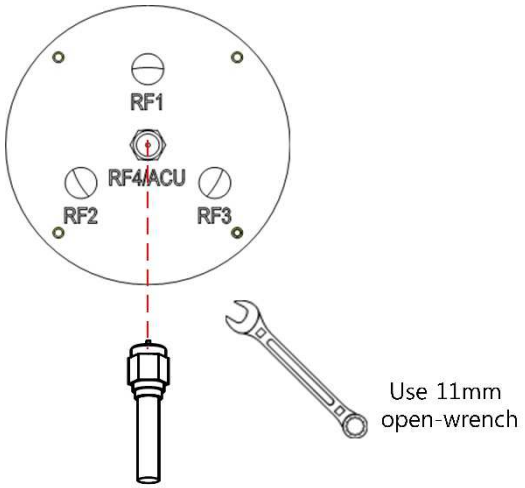


Figure 12 – connecting cable

Warning:

- Use 75ohm impedance RF cable. Also other cable type with attenuation under 20dB at 2.5GHz is available.

- Do not use excessive force when installing the cables. Make sure cables are not excessively bent, kinked, and twisted.

- Unused coax connections (on the connector bracket) must be terminated with a 75 ohm terminator.

2.7 ACU Installation

The KA-78 ACU is connected with various systems such as a Satellite receiver, ship's gyro, PC, etc. There are several functional connections that may be made on the various connectors.

To starts, place the ACU in the place where it is installed and connect the cables to the rear of the ACU as followed.

2.7.1 Single IRD Configuration

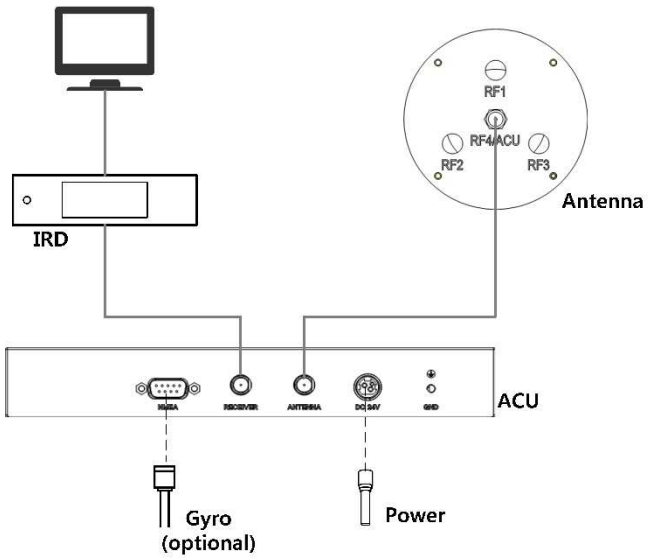


Figure 13 – single IRD Configuration

① Connect the DC "power adapter cable" to the power connector from the power source 100 ~ 240 V AC.

② Connect the RF cable threaded from RF4 port on the ADU to the "Antenna port" on the ACU panel.

③ Connect the RF cable from the "receiver port" on the ACU to the RF connector (SAT IN or LNB IN port) on the VAST or Foxtel Box. Use Sat 69 for VAST 70 for Foxtel.

④ *(Optional)* Connect the ship gyro cable from the ship gyro to the NMEA connector on the ACU. (see Section – 2.8 for more detailed gyro connection)

NOTE: *For Single IRD configuration refer to* ***Section 3.3.4 – a for ACU setting***

2.7.2 Multi IRD Configuration

This configuration can be used with or without a multi-switch. But a multi-switch may need to be used if you have multiple Foxtel or VAST set top boxes. An additional RF cable connection required for multiple IRD's

① Connect the DC "power adapter cable" to the power connector from the power source 100 ~ 240 V AC.

② Connect the RF cable threaded from the RF4 port on the ADU to the "Antenna port" on the ACU panel. Then connect to The ACU to a multi-switch H input or the Foxtel box (or VAST set top box if no Foxtel boxes are used).

③ Connect the RF cable threaded from the RF1 or RF3 port to the V input port on the multi-switch or if no multi-switch connect to the VAST set top box if there is a Foxtel box connected to RF4 port.

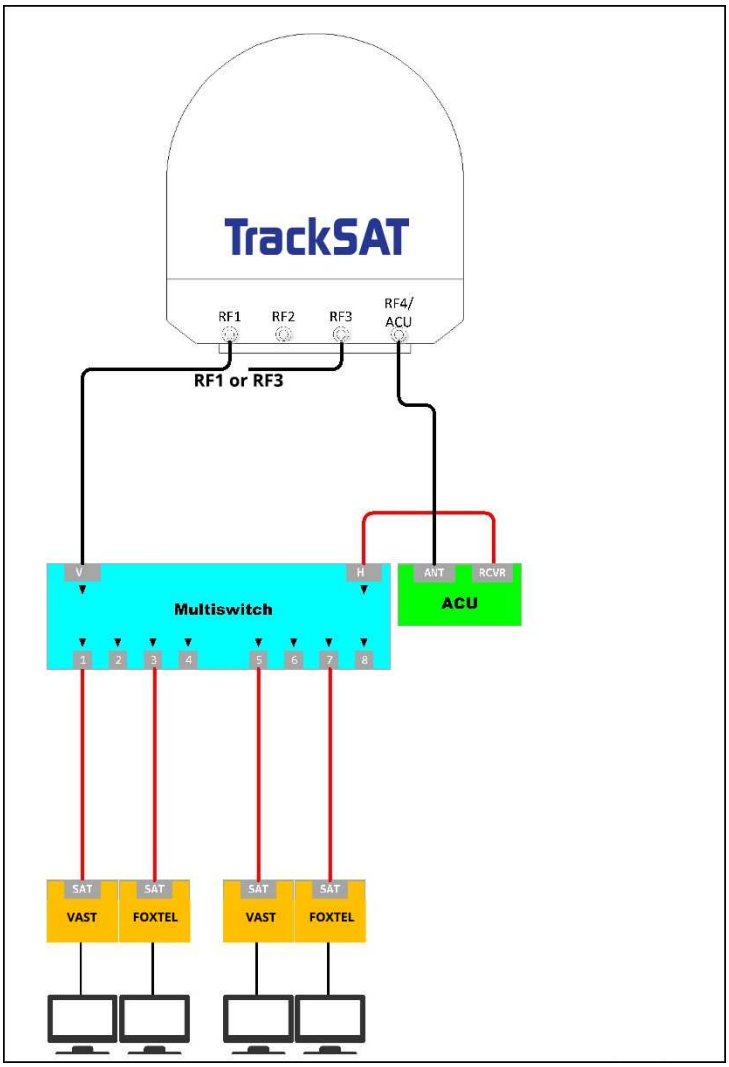


Figure 14 –Multi IRD Configuration

2.8 Connecting the Ship Gyro (optional)

Your system is able to track the satellite without having ship gyro. Although your system can be operate without the ship gyro, user may directly connect vessel's ship gyro to the antenna system when internal GPS is inoperative or to enhance the antenna's searching capability that receiving vessel's heading data will accelerate the searching speed by minimizing the searching range. To connect the ship gyro, you need to have a suitable cable and connect it to the NMEA port (see Figure – 16) with using a 9-pin female type connector (not supplied).

NOTE: *In order to connect the ship gyro to the antenna, you will need to purchase a suitable DB-9 female type connector.* (see Figure -15)

① Strip back the insulation of each cable and connect a cable to each terminal of the DB-9 connector.

② Tighten the locking screws of the DB-9 connector.

③ Connect DB-9 connector to the NMEA port on the ACU.

④ When NMEA signal is accepted via NMEA, System will be automatically restarted. No additional setting required.

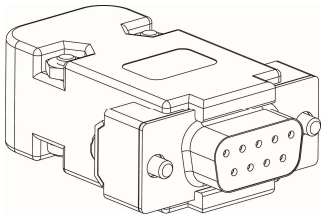


Figure 15 – DB9 Connector

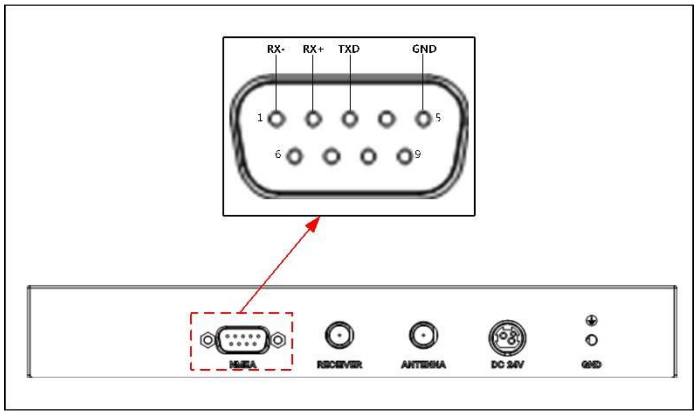


Figure 16 – NMEA Port on the ACU

When ship gyro is connected to the ACU, the vessel's heading data will be automatically displayed on the LCD main screen (see Figure - 17).

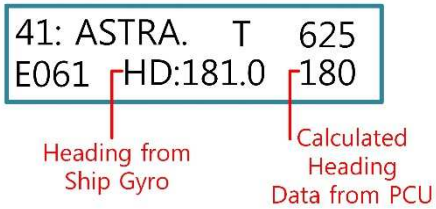


Figure 17 - LCD Display with Ship Gyro

It may takes up to 5 min to calculate your location and configure the data from the GPS satellite signal at the first power on with the gyro connected.

NOTE*: KA-78 ACU can accept the various format of NMEA, as follow: HDT, HDG, HDM.*

3. Operation

To effectively control the UltraTrack TS-series antenna system, the user must understand and use functions in the ACU operation mode.

3.1 ACU Front Panel Layout

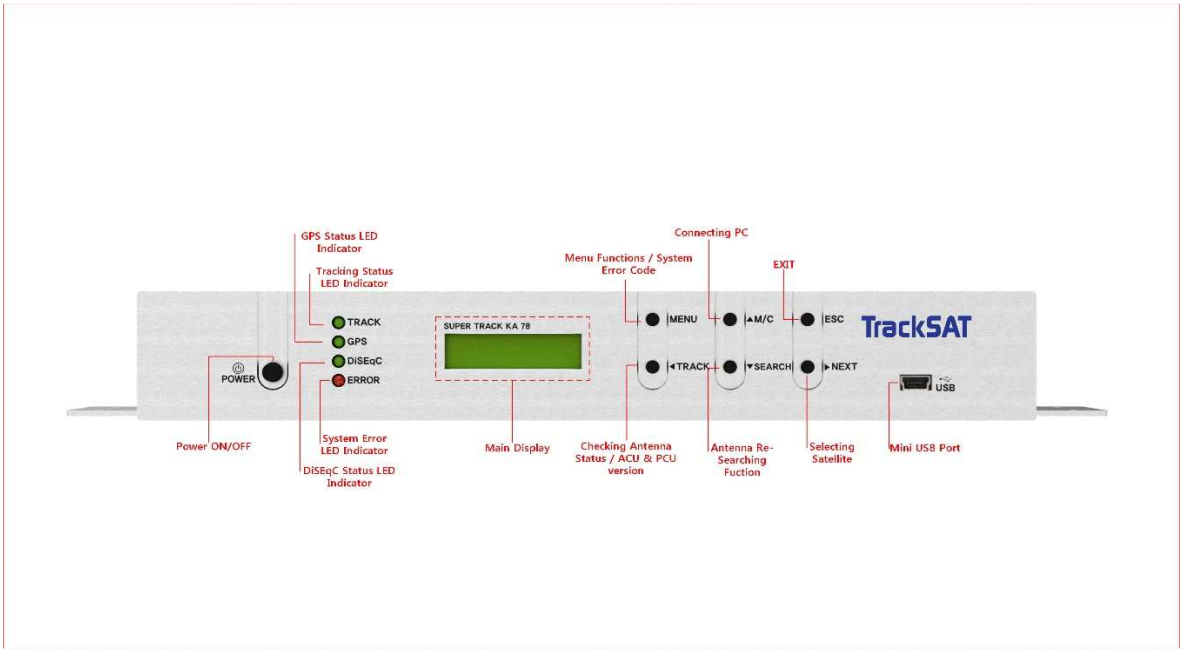


Figure 18 – ACU Front Panel

3.1.1 ACU Main Display

The KA-78 ACU shows essential data to allow the user determines the antenna system performance. (see Figure – 19)

Figure 19 – Main Display

3.1.2 LED Indicator

ACU LED light indicator shows the status of an antenna tracking, GPS, and system error.

Figure 20 – LED Indicator

LED Indicator	State	Description
Track	ON	The system is in tracking mode on the target satellite.
	Blink	In searching mode
	OFF	In initializing
GPS	ON	GPS data available
	Blink	GPS data unavailable
	OFF	GPS error or malfunction
DiSEqC	ON	DiSEqC function enabled
	Blink	22 KHz enabled
	Blink (rapidly)	DirecTV enabled
	OFF	DiSEqC disabled
Error	ON	The system error occurred
	OFF	The system properly works

Table 2 – ACU LED Indicator Status

3.1.3 Keypad Function

The following table provides a quick reference source on Key Mapping of the ACU.

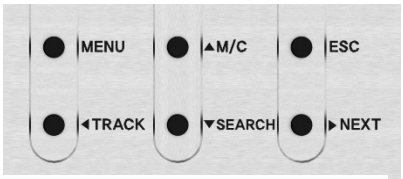


Figure 21 – Keypad Layout

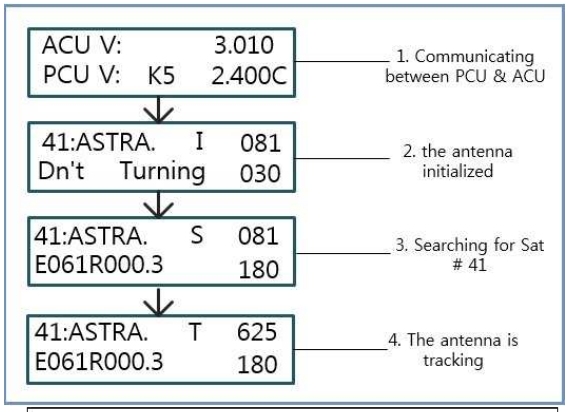
- **MENU**: 1) press button for checking error code. 2) press button for 2 sec to enter the set-up mode. 3) used as an Enter key.
- **←/TRACK**: 1) press button for checking the antenna status data (use ↑, ↓ button to scroll down). 2) press button for 2 sec for checking PCU & ACU version. 3) used as a left arrow key.
- **↑/M&C**: 1) press button for connecting PC. 2) used as an up key.
- **↓/SEARCH**: 1) press for 2 sec will make the antenna do the re-searching. 2) used as a down key.
- **ESC**: 1) press button to exit the menu.
- **→/NEXT:** 1) press button to change the target satellite manually (antenna can be programmed with up to 5 desired satellites as a default mode). 2) used as a right

arrow key.

NOTE: *Also the mini USB port is located next to the ACU keypad. It allows users to access the antenna via PC to change antenna parameters and configuration.*

3.2 Normal Mode

After power supplied to the antenna system, the antenna will be automatically initiated and acquire the primary target satellite. (see Figure-22)



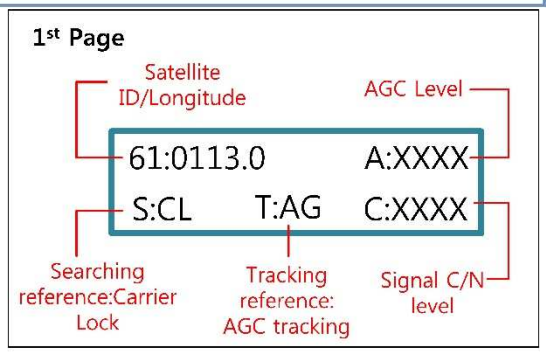
3.2.1 Changing Satellite

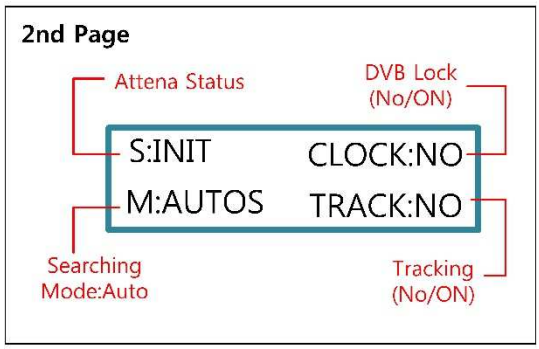
Changing satellite can be easily achieved by using "NEXT/→" button. Each time you press "NEXT/→" button will changes the programmed target satellite in numerical order (up to 5 satellites).

3.2.2 Antenna Status Monitoring

This function allows user to check the satellite ID, signal strength in AGC and C/N level, searching reference, tracking reference, DVB carrier lock status (On/No), tracking status (On/No), searching mode (Auto default), antenna status (initializing, searching, tracking), the NID (Network Identification Number) signal and satellite longitude. To use this function, press "TRACK" button and use "↑, ↓" key to scroll up/down. (see Figure- 23)

In addition, NID signal will be shown when the antenna is tracking and is only available if the satellite provides the NID signal.





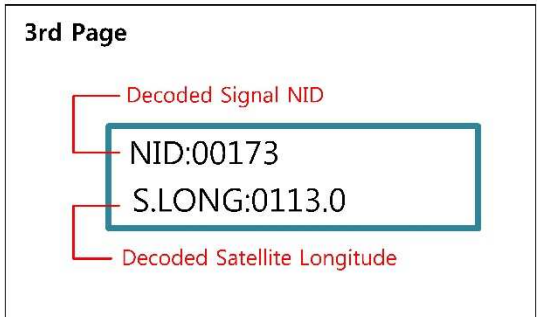


Figure 23 - Antenna Status Checking Step

3.2.3 M/C (Connecting PC)

① Connect mini USB cable from your PC to the mini USB port on the ACU front panel.

② Press "M/C" button for 2sec. this will automatically connect your PC with the antenna system.

NOTE: *KNS provides the remote access PC-software (SCS) for the antenna monitoring and setting on your PC. (See Appendix C - Software downloading)*

3.2.4 Satellite Researching

When antenna takes too long or fails to locate the target satellite by having blockage or tough sea condition etc., you may use this function. Pressing "SEARCH/↓" button for 2 sec will automatically initiate the satellite researching function.

3.2.5 Checking System Error

Press MENU button will shows system error message code in hexadecimal digit on the main LDC display. (Refer to Appendix D - Error Code)

Figure 24 - System Error Code

3.2.6 Checking System Communication Status

User may check communication status between ACU and PCU.

Figure 25 – Checking Communication Status

In the Figure - 25, Packet is the number of command from ACU and Loss is the number of loss on the PCU. More loss means having more system communication error

3.3 Set-up Mode

To enter the set-up mode, press "MENU" button for 2 sec and use "↑,↓" key to change menu and press "MENU" button to select. You may exit the set-up menu with using "ESC" button.
The set-up mode has 8 sub-menu. These are: 1) link with the PC, 2) Set latitude and longitude, 3) program area, 4) program satellite, 5) satellite parameter edit, 6) skew angle setting, 7) satellite name edit, and 8) save & exit.
The set-up menu flow chart shown below describes the searching and tracking set up procedures. (see Figure- 26)

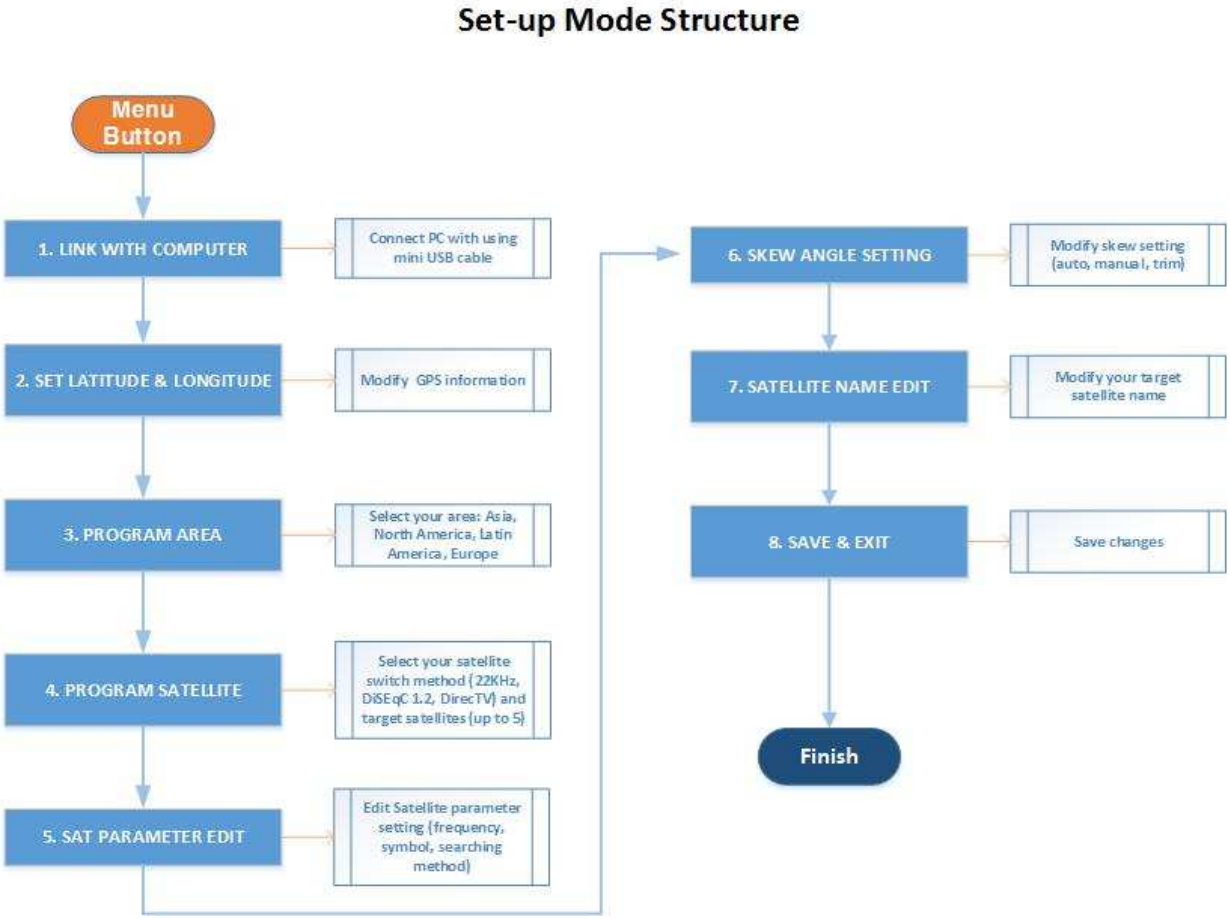

Set-up Mode Structure
Menu Button
1. LINK WITH COMPUTER
Connect PC with using mini USB cable
2. SET LATITUDE & LONGITUDE
Modify GPS information
3. PROGRAM AREA
Select your area: Asia, North America, Latin America, Europe
4. PROGRAM SATELLITE
Select your satellite switch method (22KHz, DiSEqC 1.2, DirecTV) and target satellites (up to 5)
5. SAT PARAMETER EDIT
Edit Satellite parameter setting (frequency, symbol, searching method)
6. SKEW ANGLE SETTING
Modify skew setting (auto, manual, trim)
7. SATELLITE NAME EDIT
Modify your target satellite name
8. SAVE & EXIT
Save changes
Finish

Figure 26 – Set-up Menu Flow Chart

3.3.1 Connecting PC

① To starts, connect the mini USB cable from your PC to the mini USB port on the ACU front panel.

② Press MENU button for 2 sec to enter set-up mode

③ Select the link with computer menu (use MENU button)

④ Connection has made. It allows users to access the antenna via PC to change antenna parameters and configuration

NOTE: *TrackSAT provides the remote access PC-software (SCS) for the antenna monitoring and setting on your PC. (see Appendix C - software download)*

3.3.2 Setting GPS Information

In the event of invalid GPS data or GPS malfunction. You may input your current latitude and longitude information. (See figure- 27)

NOTE: *This data will be changed when the GPS data is valid or when the ACU power is r*

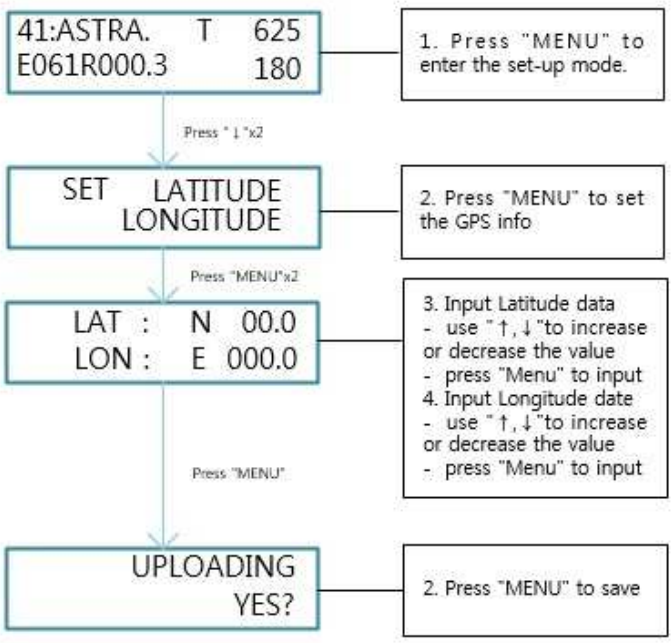

41:ASTRA. T 625
E061R000.3 180
1. Press "MENU" to enter the set-up mode.
Press "↓"x2
SET LATITUDE
LONGITUDE
2. Press "MENU" to set the GPS info
Press "MENU"x2
LAT : N 00.0
LON : E 000.0
3. Input Latitude data
- use "↑,↓"to increase or decrease the value
- press "Menu" to input
4. Input Longitude date
- use "↑,↓"to increase or decrease the value
- press "Menu" to input
Press "MENU"
UPLOADING
YES?
2. Press "MENU" to save

Figure 27 – GPS Information Setting

3.3.3 Selecting Area

Before selecting your satellites, you need to select the service area from among Asia, Europe, Latin America, and North America.

① Press MENU for 2 sec to enter set-up mode

② Press ↓key x 2 and press menu button to enter “program Area” menu.

③ Use “↑,↓” key to change area: Asia, **Asia is default**

④ Select your area and press MENU button.

3.3.4 Program Satellite for Australian Set Top Boxes (VAST & Foxtel)

(Select the desired satellites note different settings Foxtel IQ & model 250)

The user can select up to 5 desired satellites on KA-78 ACU. The user needs to select the DiSEqC mode from among the DiSEqC OFF or the DiSEqC 1.2 ON or 22KHz tones or Direct TV before selecting the satellites. Selecting Off is the correct setting for one VAST box or, Foxtel box (non IQ & model 250) and for one of each set 22KHz. Satellite 69 is for VAST & Satellite 70 is for Foxtel. With a Foxtel IQ box you will need to set the 22KHz tone function after setting Satellite 69 & 70. RF4 should go to the ACU then Foxtel box input 1 (horizontal channels), RF1 or RF3 should go directly to Foxtel box input 2 (vertical channels). With a Foxtel model 250 (white box with rounded ends with one input), you will need to use the Direct TV function (if your box has both Foxtel & FTA stations). Without all of the above settings, you will need to allocate and set up Sat 69 for **Sat A,** Sat 70 for **Sat B**, Sat 69 for Sat C Sat 70 for **Sat D** & Sat 69 for Sat E.

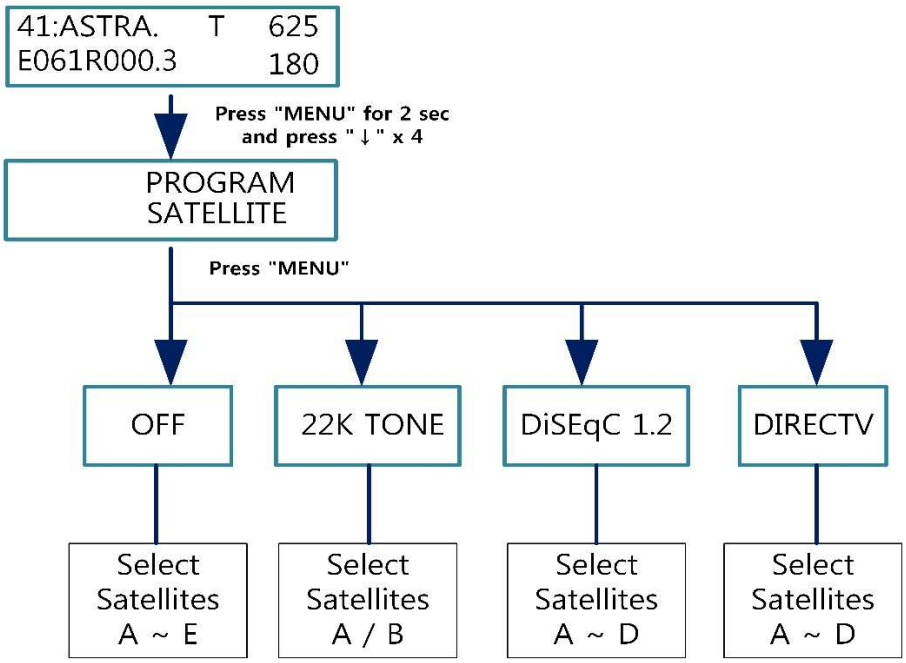


Figure 28 – Program Satellite Menu

a. DiSEqC OFF Mode (Default Mode for a VAST or Foxtel box or both)

In a DiSEqC off mode, the user can change the targeting satellite using the →(Next) button from Sat A to Sat E in programed order. After selecting the satellites from A to E, the KA-78 ACU changes the satellite when the user presses the → (Next) button. DiSEqC LED indicator status on the ACU is OFF.

DiSEqC Mode	LED Status
OFF	OFF
22KHz Tone	Blink
DiSEqC 1.2	ON
DirecTV	Blink (rapidly)

Table 3 – DiSEqC LED Status

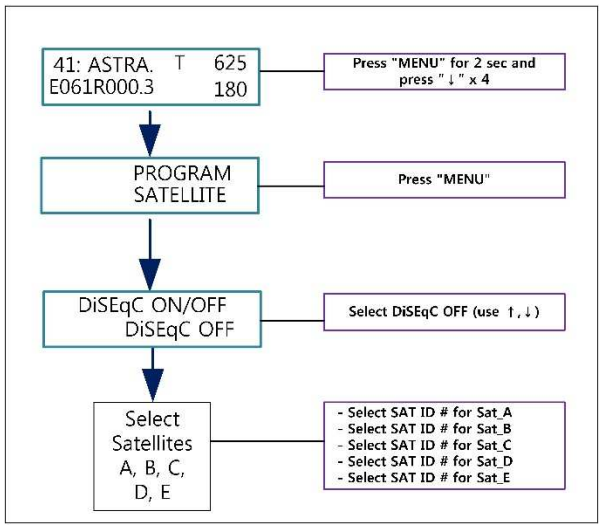


Figure 29 – DiSEqC OFF Setting

b. 22KHz Tone Mode (for multi IRD configuration)

In this mode, the antenna switches between two satellites Sat A & Sat B by the 22KHz method. In the normal operation the antenna searches for the 'SAT-A' and then, if the ACU receives the 22 KHz tone via the 'receiver' port of the AUC back panel, the ACU commands the antenna to search 'SAT-B'. This function requires the 22 KHz tone from the satellite TV receiver. **This is the correct setup for a Foxtel IQ box or for a combination of Vast & Foxtel boxes.**

① Select 22K Tone mode in the Program Satellite menu

② Select satellites: Select desired Sat ID for Sat-A slot, select the desired Sat ID for Sat-B slot, and select either 69 or 70 Sat ID for the remaining slots (Sat-C,D,E) to finish the programming. Use the down arrow to change selected satellites to save.

③ DiSEqC LED indicator status on the ACU is blinking.

c. DiSEqC 1.2 Mode

By this function, the antenna automatically switches between 4 satellites in programed order when the antenna receives DiSEqC signal from the satellite TV receiver.

① Select DiSEqC 1.2 mode in the Program Satellite menu

② Select satellites: select your desired 4 satellites for SAT A,B,C, and D

③ Select one any satellite for remaining slot SAT E to finish.

④ DiSEqC LED indicator status on the ACU is ON.

d. DirecTV Mode

This should be used for the users. Using the combination of the voltage supply (13 V/18 V) and 22 KHz tone (0 KHz/22 KHz) methods provides the mechanism for a **Foxtel box (250 model) with one input (use RF4) and FTA & Foxtel stations. All 5 satellites saved need to be a mix of Sat 69 & Sat 70.**

3.3.5 Satellite Parameter Edit

The user may edit the satellite parameters such as frequency, symbol rate, searching standard, and NID of signal. This function is useful when desired transponder's parameters are no longer available. (see Figure- 30)

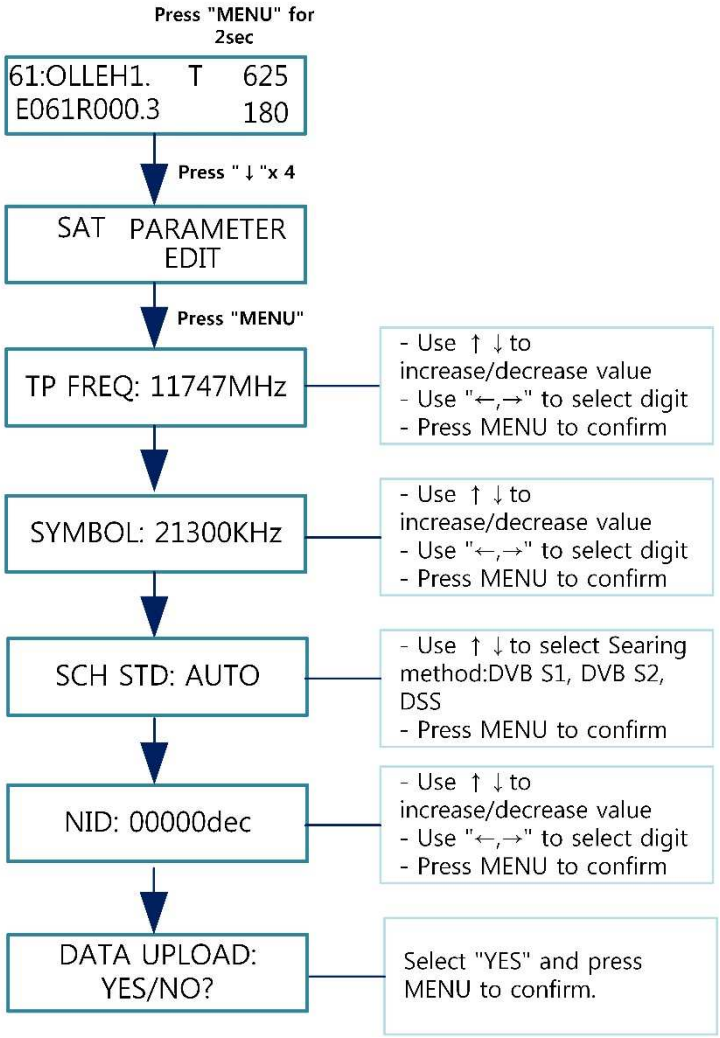

Press "MENU" for 2sec
61:OLLEH1. T 625
E061R000.3 180
Press " ↓ "x 4
SAT PARAMETER EDIT
Press "MENU"
TP FREQ: 11747MHz
- Use ↑ ↓ to increase/decrease value
- Use "←,→" to select digit
- Press MENU to confirm
SYMBOL: 21300KHz
- Use ↑ ↓ to increase/decrease value
- Use "←,→" to select digit
- Press MENU to confirm
SCH STD: AUTO
- Use ↑ ↓ to select Searing method:DVB S1, DVB S2, DSS
- Press MENU to confirm
NID: 00000dec
- Use ↑ ↓ to increase/decrease value
- Use "←,→" to select digit
- Press MENU to confirm
DATA UPLOAD: YES/NO?
Select "YES" and press MENU to confirm.

Figure 30 – Satellite Parameter Edit

3.3.6 Skew Angle Setting (note the skew angle should be set as a minus number)

The TS-series antenna's skew module works fully automatically. However, if you wants to change the skew angle for any reason, you may use the 'Manual Mode'. You may also optimize the skew angle by using trim function when desired satellite has polarity offset.

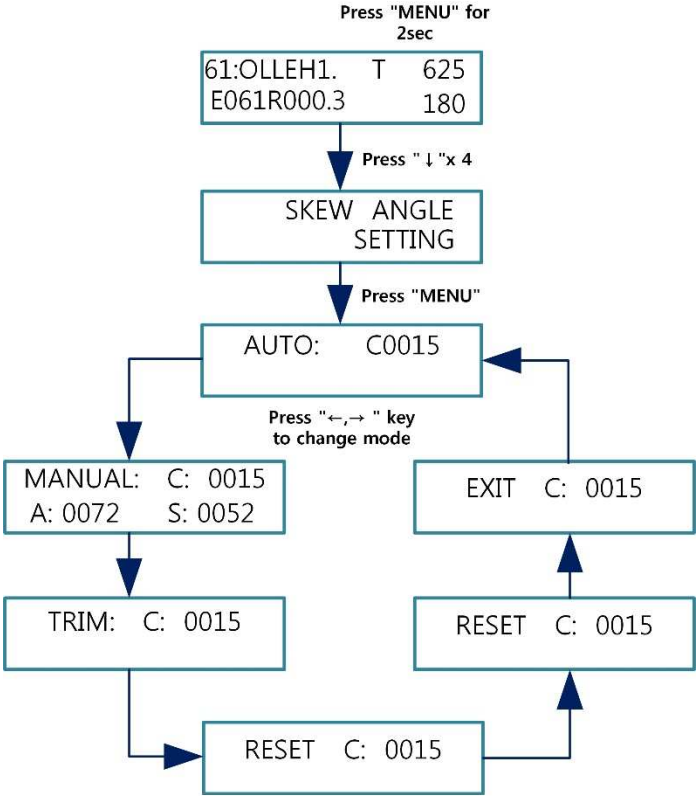


Figure 31 – Skew Angle Menu

a. Auto Mode

In the Auto mode, the ACU displays the skew angle calculated by the PCU. The TS series default skew mode is auto. The TrackSAT automatically changes the skew angle when the targeting satellite is changed.

b. Manual Mode

You can change the skew angle to the desired skew angle manually. (see Figure-32)

***NOTE**: 'C:' refers to the current skew angle. 'A:' refers to signal strength. 'S:' refers to the user setting the skew angle.*

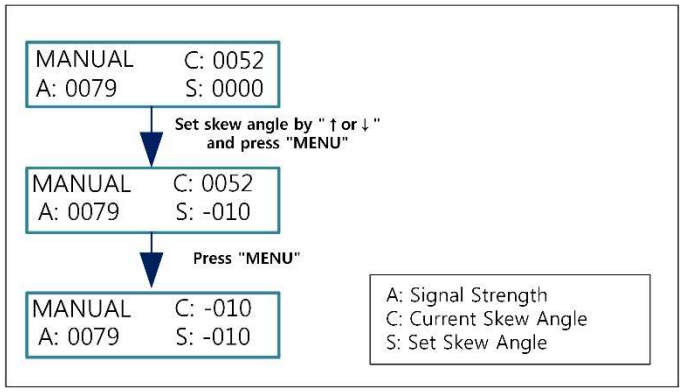

MANUAL C: 0052
A: 0079 S: 0000
Set skew angle by "↑ or ↓" and press "MENU"
MANUAL C: 0052
A: 0079 S: -010
Press "MENU"
MANUAL C: -010
A: 0079 S: -010
A: Signal Strength
C: Current Skew Angle
S: Set Skew Angle

Figure 32 – Manual Skew Agle Setting Step

c. Trim

You can optimize the default skew angle of currently tracking satellite to find a higher signal level, when desired satellite has polarity offset (Optus D3 & C1have a polarity offset) . First of all, change the skew angle where antenna can get higher signal than before in the manual mode. And then select the 'TRIM' and press the 'MENU'. Lastly, select the 'SAVE' and press the 'MENU'. After save, the skew angle of desired satellite will be changed to new position. (see Figure – 33)

NOTE: *Polarity reference of satellite is the equator. However some satellite's polarity is set at the different position (equator is not used as a reference) for various reasons. Thus, there might be the polarity offset between calculated skew angle by PCU and true skew angle on the satellite that polarity. You may check whether there is polarity offset or not on your satellite. If there is, skew angle should be changed to get a higher signal (note set skew to a - number i.e. -41).*

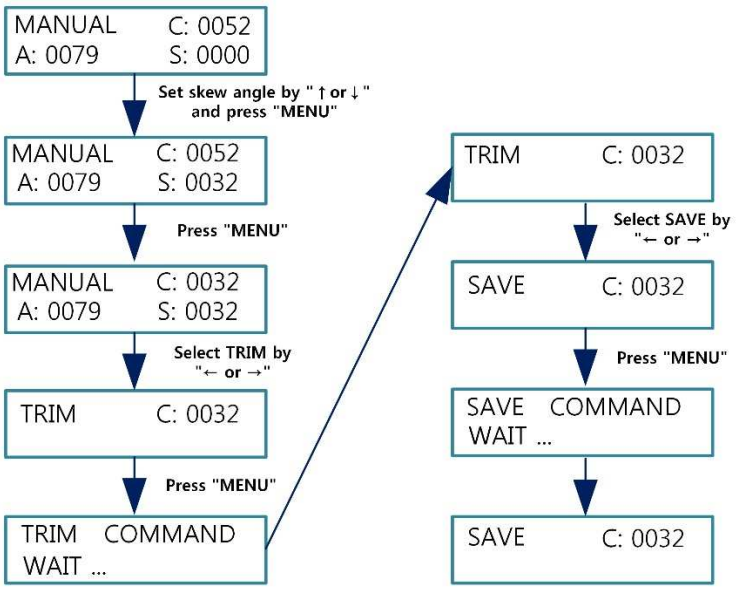


Figure 33 – Skew Trimming Step

NOTE: *the skew trimming function is available to the satellite currently in use only.*

⚠ *Improper skew trimming may deteriorate the antenna performance.*

d. Reset

The skew angle on desired satellite will be changed to initial skew angle after selecting the 'RESET' mode.

e. Save

To save the trim angle, press 'MENU' button after selecting the 'SAVE' mode.

f. EXIT

Press 'EXIT' to escape to upper menu.

3.3.7 Satellite Name Edit

You may edit the name of preset-5 satellites: Sat A ~ E. (see Figure - 33)

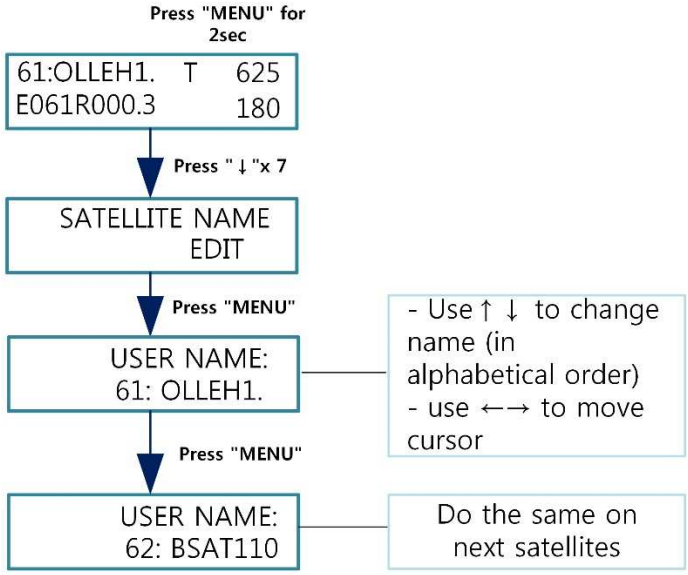

Press "MENU" for 2sec
61:OLLEH1. T 625
E061R000.3 180
Press "↓"x 7
SATELLITE NAME EDIT
Press "MENU"
USER NAME: 61: OLLEH1.
- Use ↑ ↓ to change name (in alphabetical order)
- use ←→ to move cursor
Press "MENU"
USER NAME: 62: BSAT110
Do the same on next satellites

Figure 34 - Satellite Name Edit

3.3.8 Save and Exit

Save your changes before leave the set-up menu. Otherwise, the previous parameters will be restored.

APPENDIX A – Satellite Library

1. North America

Sat ID	Satellite Longitude	Satellite Name	Polarity & LO Band	Searching Standard	Frequency (KHz)	Symbol Rate(KHz)	Beam
01	097.0W	Galaxy 19	HH	DVBS1	12,090,000	20,000,000	Ku
02	087.0W	SES2	HH	DVBS2	11,808,000	12,475,000	North America
03	101.0W	SES1	HH	DVBS2	12,020,000	30,000,000	North America
04	072.0W	AMC 6	VL	DVBS1	11,546,000	12,000,000	Canada
05	101.0W	DirecTV4S/8	RL	DVBS1	12,224,000	20,000,000	USA
06	110.0W	EchoStar11	RL	DVBS1	12,486,000	21,500,000	Conus
07	119.0W	EchoStar14	RL	DVBS1	12,370,000	20,000,000	Conus
08	148.0W	Echostar1	RL	DVBS1	12,428,000	20,000,000	Ku
09	127.0W	Echostar5	RL	DVBS1	12,457,000	20,000,000	Conus
10	072.0W	AMC-6	HL	DVBS1	11,652,000	2,163,000	
11	101.0W	DirecTV 8 R	RL	DSS	12,516,000	20,000,000	
12	101.0W	DirecTV 4S L	LL	DSS	12,530,000	20,000,000	
13	119.0W	DirecTV 7S R	RL	DSS	12,603,000	20,000,000	
14	119.0W	DirecTV 7S L	LL	DSS	12,588,000	20,000,000	
15	101.0W	User 5	RL	DVBS1	12,224,000	20,000,000	
16	101.0W	User 6	RL	DVBS1	12,224,000	20,000,000	
17	101.0W	User 7	RL	DVBS1	12,224,000	20,000,000	
18	101.0W	User 8	RL	DVBS1	12,224,000	20,000,000	
19	101.0W	User 9	RL	DVBS1	12,224,000	20,000,000	
20	101.0W	User 10	RL	DVBS1	12,224,000	20,000,000	

2. South America & Africa

Sat ID	Satellite Longitude	Satellite Name	Polarity & LO Band	Searching Standard	Frequency (KHz)	Symbol Rate(KHz)	Beam
21	063.0W	Telstar14R	HL	DVBS1	11,685,000	20,000,000	Brazil
22	113.0W	SatMex6	HH	DVBS1	12,080,000	25,635,000	Ku2
23	089.0W	Galaxy28	HH	DVBS2	11,800,000	30,000,000	South

							America
24	043.1W	Intelsat11	HL	DVBS1	10,722,000	30,000,000	Brazil
25	050.0W	Intelsat 1R	HH	DVBS2	11,920,000	29,307,000	South America
26	037.5W	Telstar	HL	DVBS1	11,482,000	11,970,000	Sub-Sahara Africa
27	095.0W	User 4	HH	DVBS1	11,960,000	30,000,000	
28	095.0W	User 5	HH	DVBS1	11,960,000	30,000,000	
29	095.0W	User 6	HH	DVBS1	11,960,000	30,000,000	
30	095.0W	User 7	HH	DVBS1	11,960,000	30,000,000	
31	095.0W	User 8	HH	DVBS1	11,960,000	30,000,000	
32	095.0W	User 9	HH	DVBS1	11,960,000	30,000,000	
33	095.0W	User 10	HH	DVBS1	11,960,000	30,000,000	
34	095.0W	User 11	HH	DVBS1	11,960,000	30,000,000	
35	095.0W	User 12	HH	DVBS1	11,960,000	30,000,000	
36	095.0W	User 13	HH	DVBS1	11,960,000	30,000,000	
37	095.0W	User 14	HH	DVBS1	11,960,000	30,000,000	
38	095.0W	User 15	HH	DVBS1	11,960,000	30,000,000	
39	095.0W	User 16	HH	DVBS1	11,960,000	30,000,000	
40	095.0W	User 17	HH	DVBS1	11,960,000	30,000,000	

3. Europe

Sat ID	Satellite Longitude	Satellite Name	Polarity & LO Band	Searching Standard	Frequency (KHz)	Symbol Rate(KHz)	Beam
41	019.2E	Astra1L	HH	DVBS1	12,633,000	22,000,000	1L
42	028.2E	Eurobird1	HH	DVBS1	12,560,000	27,500,000	Fixed
43	028.2E	Astra2B	HH	DVBS1	12,032,000	27,500,000	2B South
44	030.0W	Hispasat 1C	HH	DVBS2	11,891,000	29,000,000	Europe
45	013.0E	Hotbird9	HH	DVBS1	12,654,000	27,500,000	Europe
46	013.0E	Hotbird8	HH	DVBS1	12,437,000	27,500,000	Europe
47	004.8E	Sirius4	HH	DVBS1	12,073,000	27,500,000	Europe BSS
48	000.8W	Thor5	HH	DVBS2	11,785,000	30,000,000	T2
49	026.0E	Bard6	HH	DVBS1	11,843,000	27,500,000	BSS
50	007.0W	Nilesat102	HH	DVBS2	11,996,000	27,500,000	Middle East
51	042.0E	Turksat2A	HH	DVBS1	12,015,000	27,500,000	East
52	007.0E	Eutelsat W3A	HL	DVBS1	11,678,000	30,000,000	Europe B

53	016.0E	Eutelsat W3C	HH	DVBS1	12,606,000	27,500,000	Europe B
54	10.0E	Eutelsat W2A	HH	DVBS1	12,611,000	9,259,000	Europe
55	39.0E	Hellasat2	HH	DVBS1	12,524,000	30,000,000	F1
56	5.0W	Atlantic Bird 3	HH	DVBS1	12,543,000	27,500,000	Super
57	4.0W	Amos2	HL	DVBS1	10,722,000	27,500,000	Europe
58	23.5E	Astra3B	HH	DVBS2	11,702,000	27,500,000	Europe Wide
59	23.5E	Astra3B	HH	DVBS2	12,148,000	27,500,000	Europe Wide
60	39.0E	Hellas Sat2	HL	DVBS2	11,151,400	3,000,000	F2

4. Asia

Sat ID	Satellite Longitude	Satellite Name	Polarity & LO Band	Searching Standard	Frequency (KHz)	Symbol Rate(KHz)	Beam
61	116.0E	KOR6	HH	DVBS1	11,747,000	21,300,000	South Korea
62	110.0E	N-Sat 110	LH	DVBS1	12,551,000	29,915,000	Ku
63	75.0E	ABS1	HH	DVBS1	12,579,000	22,000,000	South
64	128.0E	JCSAT3A	HH	DVBS2	12,328,000	23,303,000	Ku
65	124.0E	JCSAT4A	HH	DVBS2	12,283,000	23,303,000	Japan
66	166.0E	Intelsat8	HH	DVBS1	12,726,000	28,066,000	Austra lia
67	144.0E	Superbird C2	HH	DVBS1	12,523,000	21,096,000	Japan
68	95.0E	NSS6	HH	DVBS1	12,647,000	27,500,000	India
69	156.0E	Optus D3	VH	AUTO	12,177,000	27,800,000	VAST
70	156.0E	Optus D3	HH	AUTO	12,177,000	27,800,000	FOXT
71	152.0E	Optus D2	HH	DVBS1	12,644,000	22,500,000	NANZ
72	108.2E	NSS11	HH	DVBS2	12,431,000	3,000,000	North Asia
73	116.0E	USER1	LL	DVBS1	11,747,000	21,300,000	South Korea
74	116.0E	USER2	LL	DVBS1	11,747,000	21,300,000	South Korea
75	116.0E	USER3	LL	DVBS1	11,747,000	21,300,000	South Korea
76	116.0E	USER4	LL	DVBS1	11,747,000	21,300,000	South Korea
77	116.0E	USER5	LL	DVBS1	11,747,000	21,300,000	South Korea
78	116.0E	USER6	LL	DVBS1	11,747,000	21,300,000	South Korea
79	116.0E	USER7	LL	DVBS1	11,747,000	21,300,000	South Korea
80	116.0E	USER8	LL	DVBS1	11,747,000	21,300,000	South Korea

APPENDIX B – Specifications

Above Deck			
Antenna Dish Diameter	61cm	**Antenna Dimension**	69cm(H) x 67cm(D)
Antenna Weight	18kg	**Radome Material**	Plastic
Minimum EIRP	46 dBW	**Azimuth Range**	690°
Skew Control	Automatic	**LNB**	Quad,10700
Ship's Motion	Roll & Pitch ±25°	**Tracking Speed**	More than 50°/sec
Platform	3-axis	**Elevation Angle**	+7° to +85°
GPS	Yes	**Vibration Damper**	N/A
DiSEqC	DiSEqC 1.2, 22 KHz, DirecTV	**Temperature**	-25°C to +55°C
Humidity	Up to 100% @ 40°C		
Below Deck			
ACU Size	232(W)*85(D)*34(H)mm	**External I/O**	RS422, Mini USB
Input Power	110/220 VAC	**Gyro Compass Input**	NMEA
Packing			
Size	82 x 82 x 92cm	**Gross weight**	27kg
Packed by	Paper carton		

Specifications subject change without notice.

APPEDIX C - UltraTrack S.C.S software

TrackSAT provides the remote access PC-software (SCS & T-Monitor) for the antenna monitoring and setting on your PC. Various types of remote access PC-software are available at **www.TrackSAT.com.au**. Before starts, you need to find out what version of S.C.S should be used for your antenna system and download correct version of the PC-software. Download and install both SCS and USB Driver software.

1. Software Download

① Visit www.TrackSAT.com.au

② Select download area

③ Click on TS series download "**SCS 1.8.3** file" to download

④ Click on TS series download "**CP210x_VCP (for KA78)"** file to download

APPENDIX D – Error Code

You may look for the system error code when antenna is working properly. Press MENU button on the ACU to check the system error message. Refer to the error code define below and you may contact KNS support team with the error code you have.

Error Code Define – (PCU version: After K 1.00)

Error Code					Error Index
0X	10	00	00	00	Satellite information is not acceptable (satellite longitude or current antenna latitude, longitude information)
0X	20	00	00	00	DVB Tuner Error
0X	40	00	00	00	Searching Fail
0X	00	01	00	00	PCU DSP EEPROM reading or writing error
0X	00	02	00	00	Roll acceleration sensor not in valid range
0X	00	04	00	00	Pitch acceleration sensor not in valid range
0X	00	08	00	00	Roll gyro scope not in valid range
0X	00	10	00	00	Pitch gyro scope not in valid range
0X	00	20	00	00	yaw gyro scope not in valid range
0X	00	40	00	00	Ship Rotate over 50degree during initialization
0X	00	00	01	00	Elevation Min Limit Switch error during initialize
0X	00	00	02	00	Skew Max Limit Switch error during initialize
0X	00	00	03	00	Skew Min Limit Switch error during initialize
0X	00	00	08	00	Azimuth Max Limit Switch error during initialize
0X	00	00	10	00	Azimuth Min Limit Switch error during initialize
0X	00	00	00	01	System has restarted
0X	00	00	00	06	A tuner I2C bus failure has occurred.
0X	00	00	00	07	The LNB polarity voltage is not within the LNB polarity range. This could indicate that the LNB voltage is not switching or that the LNB voltage is shorted
0X	00	00	00	08	The LNB signal level is below a valid range. This could indicate no LNB connected

APPENDIX E – FAQs

1. How to change my preset satellites?

Your can save up to 5 satellites and re-selecting your favorite satellites can be easily achieved by using the set-up mode. Refer to Section 3.3.4 in this manual explains the selecting satellites steps on each of satellite switching method (DiSEqC OFF, 22 KHz Tone, DiSEqC 1.2 ON, and DirecTV).

2. Why am I occasionally experiencing channel outing.

Depending on the circumstance, you may just have specific stations not appearing on the TV, or all of your channels are having trouble displaying on your television. Check the weather first that excessively bad weather can cause issues with the satellite antenna especially hard rain. The weather blocks the signal from the satellites and your receiver can't obtain the programming. Also the location of the boat can cause some channel outings. If you are at the fringe of the satellite coverage footprint, signal power levels are much weaker than the center of the footprint and your receiver can't obtain the programming.

3. How to connect Multiple TV to one TS61 antenna?

It is possible to enjoy different TV channels on multiple TV screens with one TS-series antenna. Each TV requires to have its own IRD (satellite receiver)) and maybe a multi-switch (not supplied) need to be connected between the antenna and TV. Please refer to Section 2.7.2 – Multi IRD Configuration.

4. How to use SCS remote PC-software?

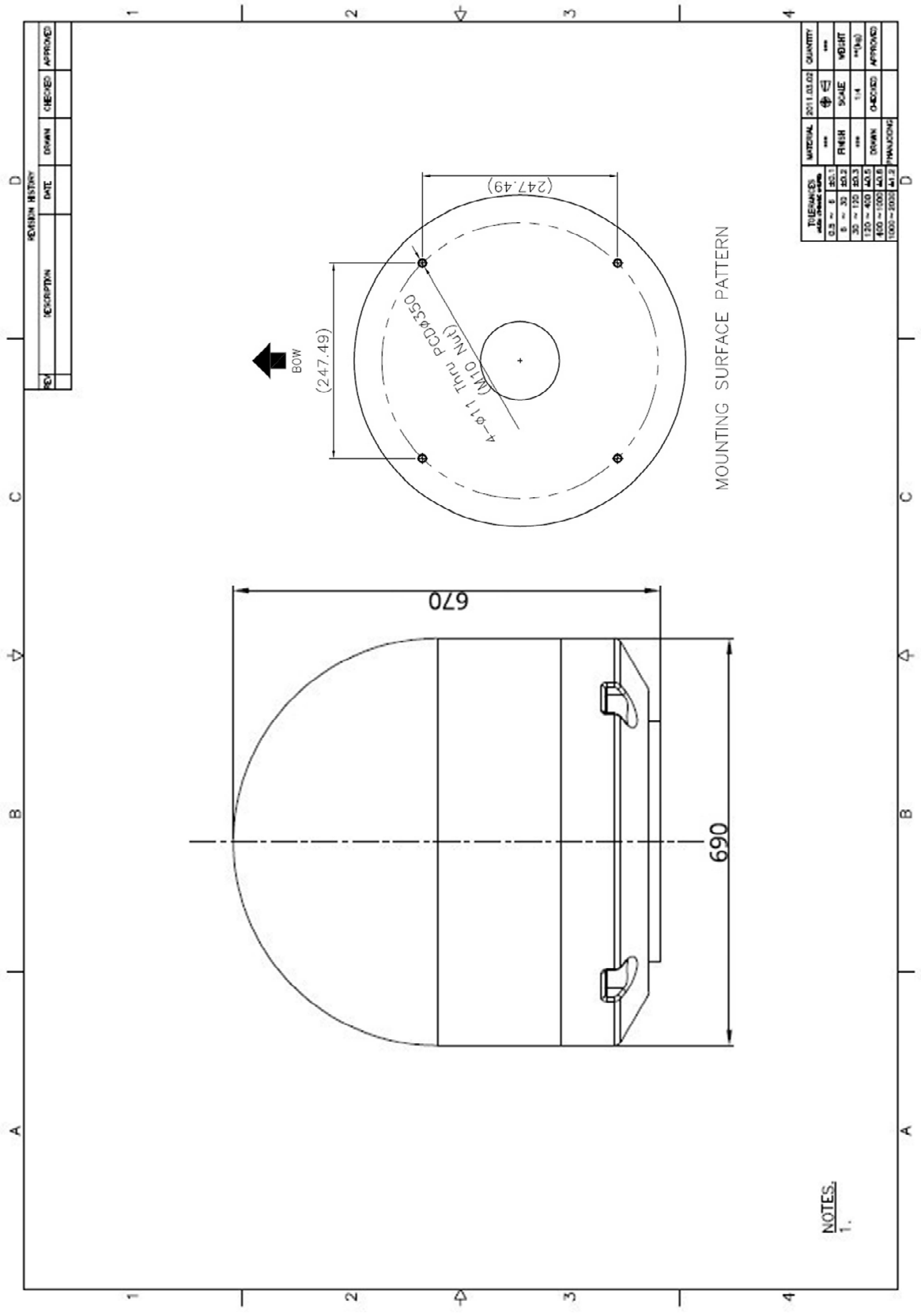
Please refer to Appendix – C for the SCS software & manual downloading and refer to it frequently.

5. How to troubleshoot?

When your antenna is not working properly, you may troubleshoot the system. Check the system error message that appeared on the ACU (refer to Section 3.2.5 – Checking System Error) and find the error code define from the error code table in Appendix – D and check the area described in the error code table.

If you still have problems, please contact your local TrackSAT dealer or our support team via e-mail: support@TrackSAT.com.au

APPENDIX F – Radome Dimension and Mounting Hole Layout



Limited Time Warranty

General Terms and Conditions

Warranty Policy

TrackSAT warrants to dealer/customer the UltraTrack Series antennas are free from defects and workmanship under normal conditions and recommended usage. The TrackSAT UltraTrack limited warranty policy is applicable to the complete antenna system including all above deck equipment (radome, stabilizer, antenna, mechanical parts, and electronic components) and below deck equipment (Antenna Control Unit) for a total of 2 years in which 2-year parts.

Warranty Policy Terms

The warranty policy is valid from the date of installation with installation invoice and/or documents, or 1 month after shipment from our facility, whichever occurs first. Original installation must be accomplished by, or under supervision of, an authorized TrackSAT dealer for Limited Warranty to be valid.

Warranty Policy Limitations

The TrackSAT 2015 Warranty Policy does not cover any television monitors, satellite receivers, modems, cables, computers, gyros and any other accessories below deck or above deck. Defects, failures, and or damages due power failures, surges, fires, floods, snow, ice, lightning, excessive heat and cold, accidents, unauthorized tampering will void this warranty policy. The warranty policy is voidable in the event a distributor/customer abuse, mishandles, misuses, negligence, improper storage, service or repair by an unqualified technician.

Warranty Policy Parts Restrictions

Failed or defective due power failures, surges, fires, floods, snow, ice, lightening, excessive heat and cold, accidents, unauthorized tampering will void this warranty policy. TrackSAT will evaluate the defective part and provide the dealer with a new rebuilt, refurbished or alternate equipment (or a part there of) of equal or improved quality as exchange equipment (or part thereof) to replace eligible defective equipment (or part thereof). Rebuilt or refurbished equipment may bear cosmetic blemishes that do not affect performance.

Revision	Date	Description	Prepared by	Approved by	Remarks
1.2	Feb 2015	Initial Release (PCU Ver. K1.050 & ACU Ver. 1.20)	Ted	C Creed	

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